



generAtIon – Exploring Generational Differences in Perception and Use of Artificial Intelligence

Gabor Keresztes¹ , Nikoletta Nemeth² ,
Katalin Meszaros³ 

¹University of Sopron, Sopron, Hungary
keresztes.gabor@uni-sopron.hu

²University of Sopron, Sopron, Hungary
nemeth.nikoletta@uni-sopron.hu

³University of Sopron, Sopron, Hungary
meszaros.katalin@uni-sopron.hu

*Corresponding author

Abstract: The rapid advancement of artificial intelligence (AI) is reshaping everyday life, the economy, and society. Generational differences strongly influence how people relate to AI, shaped by their technological experiences, trust levels and ethical considerations. While younger generations—especially Generation Z—tend to be more open and adaptable, older groups are generally more cautious. Understanding these differences is essential for fostering social acceptance of AI.

This study examines how the Hungarian population perceives and uses AI, with particular attention to generational variations. It focuses on AI use in work and private life, frequency of use, responsibility issues, and expected impacts on the labor market and human development.

The primary research (n=374) involved quantitative data collection through online and in-person questionnaires across all primary age groups. The sample reflects the population's generational distribution, and the use of a standardized questionnaire ensured comparability.

Findings show that Generations Z and Y are more knowledgeable about AI's benefits and risks and use these technologies more frequently. Younger respondents associate AI with opportunities and rapid progress, whereas older individuals adopt a more skeptical and risk-focused view. Most participants believe human oversight should remain essential and express concerns about job loss and potential risks to humanity.

Overall, although it includes demographic, educational, and occupational factors, it should include qualitative insights to emphasize opportunities, while older generations highlight risks. Future research should expand its focus to include demographic, educational, and occupational factors, and should incorporate qualitative insights to deepen understanding of generational patterns.

Keywords: AI, generation, social innovation

1 Introduction

Artificial intelligence (AI) has rapidly transformed numerous aspects of modern life and work, enabling systems to perform tasks that traditionally required human intelligence, such as learning, problem-solving, and decision-making (Kokina et al., 2025). Since its conceptual origins in the mid-20th century with Turing and McCarthy, AI has expanded its practical and theoretical applications (Huang et al., 2006; Elamin, 2024). Today, AI-based systems are embedded in everyday technologies, including search engines, recommender systems, virtual assistants, chatbots, and a wide range of data-driven decision-support tools. These developments affect not only how individuals access information and communicate but also how organizations design processes, allocate resources, and interact with customers and employees. These opportunities and challenges, which also have sector-specific characteristics, have been widely researched (for example, Erdős et al., 2025; Sharma et al., 2025; Yang & Hsu, 2026). At the same time, the growing ubiquity of AI has triggered intense public debate about its societal consequences, from enhanced productivity and innovation to concerns about privacy, bias, job displacement, and the erosion of human agency.

Generational differences play a key role in AI adoption. While in everyday life, younger generations almost rely on AI (Chan et al., 2023), older generations are more critical and skeptical (Balon, 2024), and these differences also appear in workplace environments, driven by values, attitudes, and digital literacy across age groups (Twenge, 2012; Balon, 2024). Younger cohorts are often described as “digital natives”, having grown up with pervasive internet connectivity, smartphones and social media, which may facilitate a more intuitive engagement with AI-enabled tools. In contrast, older cohorts more often represent “digital immigrants”, who have had to adapt to rapidly changing technologies later in life and may therefore display lower confidence, higher perceived risk and greater resistance toward new digital systems. Existing research on the digital divide consistently shows that age is a significant factor in technology access, skills and usage patterns (Hargittai, 2002; Neves et al., 2013), but AI introduces additional complexities because many AI-driven processes are invisible

to users and operate in the background of familiar applications (Eslami et al., 2015; Eg et al., 2023).

Understanding these generational dynamics is essential for organisations seeking to implement AI effectively. Tailoring strategies to the needs and preferences of different age groups can enhance adoption, optimise workflow integration, and address ethical and social concerns. As AI continues to expand across sectors, recognising its human and organisational dimensions remains critical to maximising its benefits while mitigating potential challenges (Choudhary et al., 2024; Seyfi et al., 2025). For employers, this includes designing training and communication that are sensitive to different levels of digital literacy and trust, ensuring that older employees are not disadvantaged in the transition to AI-enhanced work processes, and harnessing the openness and experimentation of younger employees in a responsible way. At a broader societal level, understanding how different generations perceive the opportunities and risks of AI can inform policies on lifelong learning, labour-market adaptation, and digital inclusion.

Recent empirical studies have begun to explore how age groups differ in their familiarity with AI, attitudes toward AI-supported decision-making, and actual use of AI-based applications (e.g., Kaur et al., 2023; Zhou et al., 2022). These studies generally suggest that younger generations are more likely to use AI tools in both private and professional contexts and to emphasize their potential benefits, whereas older generations tend to express greater concern about job security, loss of control and ethical implications. However, most existing investigations focus on a single generation (often students or young adults), on specific occupational groups, or on general information and communication technologies rather than AI as a distinct phenomenon (Katsantonis & Katsantonis, 2024; Sultana et al., 2025; Joo et al., 2025; Negash et al., 2025). Moreover, the majority of available evidence comes from Western European or global contexts, while Central and Eastern European countries, including Hungary, remain underrepresented despite their rapid digital transformation.

Against this backdrop, there is a clear research gap regarding how different generations within a single national context perceive and use AI, and how these perceptions relate to perceived opportunities and threats in everyday life and work. In particular, there is limited comparative evidence that simultaneously examines familiarity with AI, frequency and domains of use, and attitudes toward its potential benefits and risks across multiple generational cohorts. Furthermore, few studies have linked generational differences in AI use to broader questions of organizational adaptation and labor market change, especially in countries where digitalization has accelerated in recent years but where empirical data on AI at the population level are still scarce.

The study aims to examine generational differences in familiarity with, perceptions of, and usage of AI, as well as potential variations in attitudes and perceived opportunities and threats between Generations X and Y by analyzing questionnaire survey results. By focusing on generational patterns in one national context, the research seeks to

contribute to a more nuanced understanding of how age-related factors shape the integration of AI into daily and professional life. The findings may support organizations, educators and policymakers in designing interventions that promote inclusive and responsible AI adoption across different age groups.

2. Generations and AI – literature review

Artificial Intelligence (AI) refers to the aggregate of systems and algorithms capable of problem-solving, decision-making, learning, and adaptation in a manner analogous to human cognition. Definitions frequently cluster around machine learning, expert systems, and neural networks (Kokina et al., 2025). The origins of AI can be traced back to the 1940s and 1950s: Alan Turing proposed the possibility of automated intelligence, while John McCarthy coined the term artificial intelligence in 1956 and organized the first Dartmouth Conference (Huang et al., 2006). In subsequent decades, rule-based and symbolic systems dominated the field until alternating algorithmic cycles gave rise to machine learning and deep neural networks, reshaping research directions (Elamin, 2024).

Contemporary scholarship increasingly investigates generational attitudes and intergenerational differences regarding the adoption and use of emerging technologies. Members of Generations Y and Z, generally considered more digitally literate, tend to adopt novel tools more rapidly and openly than older cohorts (Choudhary et al., 2024). This trend appears equally applicable to AI. Several studies have demonstrated that younger generations (e.g., Z and Y) engage more actively with AI-based applications, while older generations show slower adoption rates and express greater apprehension concerning AI usage (Chan et al., 2023; Babu et al., 2024). Recognizing generational technological differences has thus become indispensable: companies and service providers must understand the needs of diverse age cohorts to design user-friendly systems (Choudhary et al., 2024).

Twenge's (2012) earlier findings indicate that younger generations prioritize self-realization and self-assertion, whereas older cohorts exhibit a more stable and conservative value orientation. According to Balon's (2024) review, Baby Boomers emphasize collective work; Generation X tends to be more critical, skeptical, and individualistic; Generation Y is value-oriented with higher expectations; and Generation Z is particularly sensitive to mental health, safety, and social justice.

Nevertheless, some studies suggest that intergenerational differences in attitudes, values, and technology use may be modest, highly context-dependent, and influenced by cultural and socioeconomic factors (Fuchs et al., 2024; Costanza, 2023). The Age-

Period-Cohort (APC) approach and the lifespan perspective often provide a more theoretically robust framework than traditional generational labelling (Rudolph et al., 2020; McKercher, 2023). Table 1 shows the values and attitudes of generations.

Table 1. Characteristic Generational Attitudes Toward Technology

Generations	Birth years (approximately)	Characteristic values / attitudes
Baby Boomers	~1946–1964	Optimistic, team-oriented, loyalty, commitment (Balon, 2024)
Generation X	~1965–1980	Sceptical, independent, informal, striving for work–life balance (Fuchs et al., 2024; Balon, 2024)
Generation Y	~1981–2000	Growth-oriented, ethical commitment, technology-oriented, self-assertive (Fuchs et al., 2024; Twenge, 2012; Balon, 2024)
Generation Z	~1995/97–2010	Digital natives, sensitive to mental well-being, community-minded (Balon, 2024)
Synthesis of generational effects	–	Generations are social constructions; effective differences are minor; age/lifespan models provide stronger explanatory power (Rudolph et al., 2020; Costanza, 2023)

In everyday life, younger generations are the most reliant on artificial intelligence (AI). Generation Z students and university learners worldwide report using ChatGPT and other AI tools daily for learning and communication (Chan et al., 2023; Babu et al., 2024). One study found that members of Generation Z adopt an optimistic stance toward the opportunities provided by generative AI (e.g., increased efficiency, personalized learning), while teachers from Generations X and Y are more inclined to emphasize concerns about overreliance and ethical implications (Chan et al., 2023). Similarly, post-pandemic surveys revealed that members of Generations Z and Y are more likely to integrate AI into their everyday tasks compared to older age groups. Overall, younger individuals appear to embed AI more quickly into their daily routines, whereas older generations tend to follow technological advances more theoretically and generally approach them with greater caution (Chan et al., 2023; Choudhary et al., 2024).

Comparable generational differences can also be observed in workplace environments. Generation Z and Millennial employees report higher levels of AI use and more favorable experiences, for example, through automated analytics or intelligent assistants. In contrast, Baby Boomers and Generation X demonstrate significantly lower AI usage rates and express stronger reservations about its implementation (Babu et al., 2024; Choudhary et al., 2024). A comprehensive literature review emphasizes the importance of deliberately bridging generational gaps in technological adaptation within organizations—such as through continuous training and fostering intergenerational collaboration—to ensure that employees across all age groups can effectively utilize new systems (Choudhary et al., 2024). Moreover, empirical studies suggest that younger employees generally display greater confidence in integrating AI into their workflows. At the same time, older colleagues are more likely to bypass AI solutions or substitute them with personal expertise, partly due to mistrust and apprehension toward technological novelty (Chan et al., 2023; Choudhary et al., 2024). Differences are also visible in generational attitudes. Members of Generations Z and Y exhibit stronger technological optimism and adaptability to innovation, emphasizing the opportunities inherent in AI and rapidly adopting emerging AI solutions. By contrast, Baby Boomers and Generation X tend to display greater skepticism, with data protection, ethical concerns, and job stability being more salient to them (Chan et al., 2023; Seyfi et al., 2025). Recent studies indicate that older cohorts are primarily concerned with the “known risks” of AI—such as system credibility and reliability—whereas younger generations place stronger emphasis on potential benefits (Chan et al., 2023; Seyfi et al., 2025). At the same time, comparative research demonstrates that differences in AI trust and acceptance across generations are largely contingent upon the level of training and experience users possess, with higher AI literacy significantly increasing confidence, particularly among younger, better-educated individuals (Choudhary et al., 2024; Seyfi et al., 2025).

From a global perspective, the fundamental patterns of generational differences appear consistent. Studies from various countries (e.g., the United States, South Korea, Iran) consistently demonstrate that younger cohorts, particularly Generation Z, lead in everyday and workplace adoption of AI (Chan et al., 2023; Babu et al., 2024). Nevertheless, attitudes and usage patterns can vary across national contexts due to cultural and economic factors. For instance, both East Asian and Western surveys confirm that, despite generational differences, user education and the provision of adequate infrastructure remain critical prerequisites for seamless AI access and adoption (Choudhary et al., 2024; Seyfi et al., 2025).

In sum, existing evidence suggests that, in both everyday and workplace contexts, AI adoption reflects common generational divides: younger cohorts exhibit faster uptake, while older groups tend to approach AI with greater reservations—though neither cohort is homogeneous. For firms and service providers, it is therefore essential to design AI strategies that account for the diverse needs and attitudes of different

generations (Choudhary et al., 2024; Seyfi et al., 2025). Table 2 shows the main characteristics of generations towards AI.

Table 2. Generations and AI

Generatio n	Every day AI use	Workplace AI use	Predominant attitudes
Baby Boomers	Relatively low; mostly passive use (e.g., infrequent reliance on smartphone assistants) (Chan et al., 2023; Choudhary et al., 2024).	AI tools are applied less frequently; frequent reservations concerning data privacy and job stability (Chan et al., 2023; Seyfi et al., 2025).	Sceptical and cautious; concerns over security and ethics.
Generation X	Moderate level; some subgroups (e.g., managers, IT professionals) actively employ AI-based tools.	Partial use of AI in work contexts, but resistance is common; strong need for training (Chan et al., 2023; Choudhary et al., 2024).	Mixed: some recognise efficiency gains, while others remain distrustful of excessive machine reliance.
Generation Y (Millennials)	A higher proportion reports daily use of AI tools (e.g., recommender systems, chatbots) (Babu et al., 2024; Chan et al., 2023).	Generally accepting; more frequently integrate AI-based solutions into their tasks (Chan et al., 2023; Choudhary et al., 2024).	Optimistic and open to innovation; quick to learn new AI applications.
Generation Z	Most active AI users in everyday life (e.g., ChatGPT, social media algorithms) (Babu et al., 2024; Chan et al., 2023).	Report the highest levels of AI use in the workplace as well; actively seek innovative solutions.	Strongly technology-optimistic; confident in AI’s benefits (e.g., productivity, personalisation) (Chan et al., 2023).
Global outlook	Similar trends across countries: younger cohorts adopt AI more rapidly, but awareness-raising remains essential	Tailored training and AI adoption strategies are required worldwide to bridge generational gaps (Choudhary et al.,	Generational patterns appear universal (e.g., openness to innovation vs. trust-related concerns), though

Generation	Every day AI use	Workplace AI use	Predominant attitudes
	(Chan et al., 2023; Seyfi et al., 2025).	2024; Seyfi et al., 2025).	regional variations persist.

3. Research questions and methodology

The main objective of this quantitative study was to investigate generational differences in knowledge, attitudes, and usage habits related to artificial intelligence (AI). Specifically, the research aimed to:

- Examine the level of familiarity with AI concepts across different generational cohorts.
- Assess generational differences in attitudes toward the opportunities, risks, and ethical considerations of AI.
- Explore the frequency and patterns of AI usage in both everyday life and workplace settings among various generations.
- Identify correlations between demographic factors (e.g., age, education, occupation) and AI-related knowledge, attitudes, and usage habits.

Related to these research objectives, the following research questions were defined:

- a) How familiar are individuals from different generations with the concept of AI?
- b) How do generational cohorts differ in their perceptions of the advantages, disadvantages, and potential threats of AI?
- c) To what extent do different generations use AI-enabled tools in their daily life and at work?
- d) Are there significant differences between Generations X and Y regarding their attitudes toward AI, and do they perceive its opportunities and threats similarly?

Our quantitative research aimed to explore knowledge, attitudes, and usage habits related to artificial intelligence (AI) across different generations. The questionnaire was developed by the authors, drawing on existing instruments used in previous research on technology acceptance and AI attitudes. Participants were recruited through voluntary response and quota sampling, with quotas set for age groups and gender to approximate the Hungarian population structure. In terms of the proportions of each generation in the research sample, they are distributed as follows: 5% veterans, 14% boomers, 24%

Generation X, 21% Generation Y, 15% Generation Z, 21% Alpha Generation. Based on all this, the research sample can be considered representative based on this statistical distribution, as it corresponds to the proportions of generations calculated based on the 2024 population register of the Central Statistical Office (the responses of the alpha generation were excluded from the study, as they typically represent a population group under 15 years of age, thus having no relevance to the labor market).

Nevertheless, the non-probability sampling means the sample is not fully representative of the Hungarian population. Therefore, the findings should be interpreted as indicative patterns among the respondents rather than as precise population estimates.

Items were adapted to the Hungarian context and to the specific focus on generational differences. A total of 374 individuals participated in the study, selected through quota sampling, taking into account age and generational distribution. Based on these criteria, the sample can be considered representative of the respective generational cohorts. Data collection was conducted both online and through face-to-face interviews. The latter was carried out using paper-based questionnaires, primarily targeting older age groups with limited digital access.

The standardised questionnaire was divided into three main sections:

- Demographic data: including gender, age, generation, educational attainment, place of residence, occupation, and income level.
- Attitudinal items: we applied a 5-point Likert scale to assess respondents' agreement with statements related to AI, examining familiarity with the concept, perceived advantages and disadvantages, responsibility attribution, and perceived threat to employment.
- Usage habits: we used a 5-point Likert scale to measure the extent to which respondents use AI-based tools in everyday life and in the workplace.

An open-ended question was included to gather respondents' general opinions about AI, in order to obtain more detailed insights into individual perceptions.

Data were processed using SPSS. Descriptive statistics, cross-tabulations, the Kruskal–Wallis test, the Mann–Whitney U test, Pearson's chi-squared test, and content analysis were applied.

Based on secondary data, the following hypotheses were formulated:

H1: There is a significant difference between generations in terms of how well they understand the concept of artificial intelligence (AI).

H2: Younger generations (Generation Z and Generation Y) view the development of AI more positively than older generations (Generation X, Baby Boomers, Veterans).

H3: The frequency of use of AI-powered tools is significantly higher among younger generations (Generation Z and Generation Y).

H4: The attitudes of Generation X and Generation Y toward artificial intelligence differ significantly, although both generations perceive similar opportunities and threats.

3.1. Sample Characteristics

Gender distribution in the sample is balanced: 43.9% of respondents identified as male, and 56.1% as female. In terms of generational breakdown, Veterans (aged 79 and above) represent 5.9% of the sample, Baby Boomers (aged 60–78) 24.3%, Generation X (aged 45–59) 27.8%, Generation Y (aged 25–44) 24.6%, and Generation Z (aged 14–24) 17.4%.

Regarding educational attainment, the majority of respondents hold a secondary-level qualification (53.2%). A higher education degree was reported by 35.0%, while 11.8% indicated primary-level education.

As for place of residence, 37.2% of respondents live in a city, 34.2% in a county-level city, and 28.6% in a village or rural area.

In terms of employment status, nearly half of the respondents (45.2%) are employed. Retirees make up 25.9%, students 17.1%, and entrepreneurs represent 8.8% of the sample.

Subjective assessment of financial status reveals that 66.3% consider their situation average, 17.1% below average, and 16.6% above average.

4. Research Findings and Hypothesis Testing

Familiarity with the concept of artificial intelligence across generational groups was analysed using the non-parametric Kruskal–Wallis test. According to descriptive statistics (see table), the highest average familiarity with the term “artificial intelligence” was observed among Generation Z (mean: 4.54). At the same time, the lowest was found among members of the Veteran generation (mean: 2.14) (Table 3).

Table 3. Familiarity with the concept of artificial intelligence

Generation	Sample (person)	Average AI knowledge	Standard deviation
Generation Z	65	4.54	0.77
Generation X	104	3.87	1.08
Generation Y	92	4.04	1.00
Baby Boomer	91	3.10	1.50
Veteran	22	2.14	1.25
Total	374	3.74	1.30

The Kruskal–Wallis test revealed a statistically significant difference in the familiarity with the concept of artificial intelligence across generations (Chi-square = 73.056; df = 4; p = 0.000). Based on this result, generational affiliation significantly influences familiarity with AI. An examination of the mean rank scores indicates that respondents

from Generations Z, X, and Y perceive themselves as more familiar with the concept of artificial intelligence. In contrast, members of the Baby Boomer and especially the Veteran generation show substantially lower mean rank scores, suggesting a lower level of AI familiarity among these older cohorts (Table 4).

Table 4. Familiarity with the concept of artificial intelligence – mean rank

	N	Mean Rank
Generation Z	65	254.14
Generation X	104	191.78
I am familiar with the concept of artificial intelligence. Generation Y	92	206.92
Baby Boomer	91	142.51
Veteran	22	75.30
Total	374	

The group medians were as follows: familiarity with the concept of artificial intelligence was highest among Generation Z (4.623), followed by Generation Y (4.194), Generation X (4.000), the Baby Boomer generation (3.147), and the Veteran generation (1.875) (Table 5).

Table 5. Familiarity with the concept of artificial intelligence – mean, median, standard deviation

I am familiar with the concept of artificial intelligence.					
Generation	N	Mean	Median	Grouped Median	Standard Deviation
Baby Boomer	91	3.099	3.000	3.147	1.4986
Veteran	22	2.136	2.000	1.875	1.2458
Generation X	104	3.865	4.000	4.000	1.0799
Generation Y	92	4.043	4.000	4.194	1.0045
Generation Z	65	4.538	5.000	4.623	0.7721

Total	374	3.738	4.000	4.021	1.2999
-------	-----	-------	-------	-------	--------

Figure 1 illustrates the distribution of the knowledge of the concept of artificial intelligence across generations. The Z generation has the highest median (5), with an interquartile range of 4-5, indicating that the majority of respondents in this group report a complete understanding of the concept of artificial intelligence. The standard deviation is low. For both the X and Y generations, the median is also high (4), with an interquartile range of 3-5; however, the standard deviation is greater than that observed in the Z generation. Among Baby Boomers, the median is lower (3), and the distribution is wider, showing a substantial difference compared to the Z generation. The Veteran generation has the lowest median (2), with the majority of respondents in the lower range.

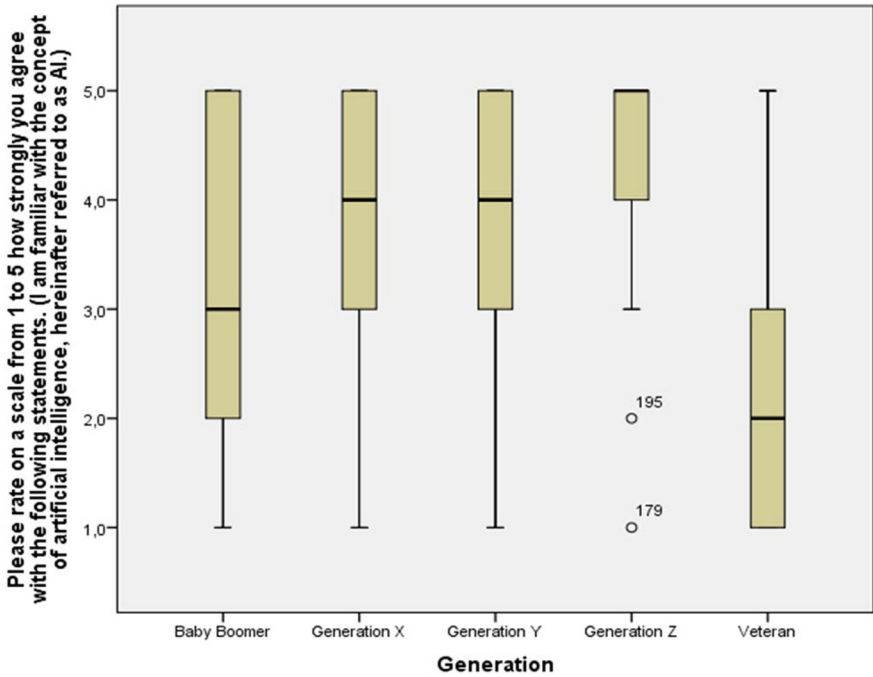


Figure 1. The knowledge of the concept of artificial intelligence

To analyse generational differences, respondents were categorised into two main age groups. The younger age group included individuals under 44 (Generations Z and Y), while the older age group comprised individuals aged 45 and above (Generations X, Baby Boomers, and Veterans). Members of Generations Z and Y grew up in a digital

environment and are therefore more likely to be open to emerging technologies, including artificial intelligence (AI). In contrast, digital technologies played a lesser role in the socialisation of the Veteran and Baby Boomer generations, which may lead to more conservative attitudes toward the development of AI.

In the analysis, we examined the extent to which members of the five generations, grouped into these two broader categories, agreed with the statement: „Artificial intelligence may represent rapid and lasting progress for humanity”, as measured on a 5-point Likert scale.

To compare the younger and older generational groups, a Kruskal–Wallis test was conducted (Table 6). The results show that the younger generations (Z and Y) had a higher mean rank score (203.43) compared to the older generations (174.37). This suggests that younger respondents are significantly more optimistic about the potential benefits of AI development. The test statistic was Chi-square = 7.116; df = 1; p = 0.008, indicating that the difference is statistically significant. These findings imply that younger generations tend to be more open, informed, and curious about artificial intelligence, whereas older generations are less likely to identify with technological advancement or to trust it.

Table 6. Results of the Kruskal-Wallis test

AI may represent rapid and lasting progress for humanity.						
Generation	N	Mean	Mean Rank	Median	Grouped Median	Std. Deviation
Younger generation	169	3.669	203.43	4.000	3.733	1.0950
Older generation	205	3.283	174.37	3.000	3.407	1.3053
Total	374	3.457		4.000	3.565	1.2284

To examine how frequently different generations use artificial intelligence (AI)-based technologies, a cross-tabulation analysis was conducted. Among the Veteran and Baby Boomer generations, AI usage was notably low. Within the Veteran generation (N = 22), more than 63.6% reported never using AI, and only 9.1% reported daily use. A similar pattern was observed among Baby Boomers (N = 91), with 56.0% indicating they never use AI, 22.0% reporting weekly or more frequent use, and 8.8% reporting daily use. In contrast, Generation X (N = 104) showed greater openness to AI technologies: only 21.2% reported never using AI tools, while 38.4% reported using them weekly or more frequently. Among Generation Y (N = 92), 51.1% used AI at least weekly, including 26.1% who reported daily use and 17.4% using it several times a week. The "never" response was the lowest in this group, at 7.6%. The youngest group, Generation Z (N = 65), proved to be the most active AI users: 53.9% reported using AI

at least weekly, with 20.0% using it daily. The results of the analysis indicated a statistically significant association between generational cohort and frequency of AI usage ($\chi^2 = 121.249$; $df = 20$; $p = 0.000$). It can be concluded that members of the Veteran and Baby Boomer generations have substantially limited engagement with AI, which may be attributed to lower levels of digital literacy and limited exposure to technology in their formative years. Generation X appears to be more open and adaptable to AI use. The most active users are members of Generations Y and Z. Interestingly, despite Generation Z's digital socialisation, Generation Y reported higher rates of daily AI use in the sample. This may be explained by the fact that 85.9% of Generation Y respondents are already active in the labour market, where AI is often used as a functional tool in professional settings. In contrast, 84.6% of Generation Z respondents are currently enrolled in higher education and thus are less likely to be employed full-time. It can be assumed that many of their encounters with AI are passive or indirect.

To further investigate attitudinal differences, a Mann–Whitney U test was used to compare Generations X and Y based on their responses to selected attitude statements. The aim was to determine whether the rank-order responses to key attitudinal items differ significantly between these two cohorts.

For Generation X, the mean ranks (MR) for the examined statements were as follows: artificial intelligence (AI) may represent a rapid and lasting threat to humanity (MR = 99.22); AI may represent rapid and sustained progress for humanity (MR = 94.81); AI may replace human labour and endanger jobs (MR = 105.64); AI may help to solve labour shortages in specific sectors (MR = 98.08); responsibility for AI decisions should rest with humans (MR = 91.27); AI may facilitate work performance (MR = 89.36); and AI may facilitate everyday life (MR = 86.75). For Generation Y, the corresponding values were: AI may represent a rapid and sustained threat to humanity (MR = 97.69); AI may represent rapid and sustained progress for humanity (MR = 102.67); AI may replace human labour and endanger jobs (MR = 90.43); AI may help to solve labour shortages in specific sectors (MR = 98.97); responsibility for AI decisions should rest with humans (MR = 106.67); AI may facilitate work performance (MR = 108.83); and AI may facilitate everyday life (MR = 111.758). From these averages, it can be observed that among the seven statements under investigation, only two (“AI may represent a rapid and lasting threat to humanity” and “AI may replace human labour and endanger jobs”) received lower mean ranks among Generation X, while five statements received lower mean ranks among Generation Y. However, these results alone do not indicate whether the differences between Generation X and Generation Y are statistically significant. For the statement “AI may represent a rapid and lasting threat to humanity,” the results were $p = 0.845$, $U = 4709.5$, and for the statement “AI may replace human labour and endanger jobs,” the results were $p = 0.052$, $U = 4041.5$. In both cases, no significant difference could be demonstrated. Similarly, for the statements “AI may represent rapid and sustained progress for

humanity” ($p = 0.315$, $U = 4400.5$) and “AI may help to solve labour shortages in certain sectors” ($p = 0.909$, $U = 4740.5$), no statistically significant differences were found. Significant differences, however, were observed in three statements: “Responsibility for AI decisions should rest with humans” ($p = 0.043$, $U = 4032.0$); “AI may facilitate work performance” ($p = 0.013$, $U = 3833.5$); and “AI may facilitate everyday life” ($p = 0.002$, $U = 3562.0$). This indicates that these three statements were more strongly endorsed by members of Generation Y than by members of Generation X. Nevertheless, it is important to examine the mean and median values for both generational groups. About all seven statements, only minimal differences can be observed in both the mean values and the group medians between Generations X and Y.

In the questionnaire, respondents were asked to share their general opinions about artificial intelligence. The textual responses were analysed using thematic content analysis, with special attention to differences between Generation X and Y. Keywords frequently appearing in Generation X’s responses - such as “danger,” “control,” “regulation,” and “automation” - suggest a more cautious and distrustful attitude, emphasising risks and the need for regulation. In contrast, Generation Y’s dominant terms - “useful,” “progress,” “help,” and “future” - indicate that this group tends to perceive AI as an opportunity, a driver of progress, and socially beneficial.

These findings partially support the differing attitudes toward AI between Generation X and Y. Table 7 summarises the confirmation or rejection of the hypotheses based on the analyses.

Table 7. The results of the Hypotheses

H1: There is a significant difference between generations in terms of how well they understand the concept of artificial intelligence (AI).	Accepted
H2: Younger generations (Generation Z and Generation Y) view the development of AI more positively than older generations (Generation X, Baby Boomers, Veterans).	Accepted
H3: The frequency of use of AI-powered tools is significantly higher among younger generations (Generation Z and Generation Y).	Accepted
H4: The attitudes of Generation X and Generation Y toward artificial intelligence differ significantly, although both generations perceive similar opportunities and threats.	Rejected

5. Limitations of the Research

The aim of our study was primarily to map attitudes, knowledge, and usage habits related to artificial intelligence, based on respondents' generational groups. Several limitations of our research can be identified:

- The generational distribution of the sample can be considered representative; however, the voluntary nature of the response—especially via online questionnaires—may bias the results toward respondents who are more digitally active and more open to technology. Furthermore, additional demographic characteristics in the sample, such as education level or occupation, which may be under- or overrepresented, could have influenced opinions. Although quotas were used to improve the generational distribution, the sample is not fully nationally representative. As a result, the findings should be generalised with caution.
- The meaning and interpretation of AI-related concepts in the questionnaire may have varied among respondents.
- Artificial intelligence is still rapidly evolving today, and for certain generations, it may be an unfamiliar area, so responses may not necessarily reflect the respondents' proper attitudes.
- The questionnaire also included an open-ended question that allowed for individual viewpoints to be expressed. However, due to the brevity and varying levels of detail in the responses, the content analysis is only able to capture the underlying explanations to a limited extent, which could be fully revealed through qualitative research.

Conclusions

The research demonstrates pronounced generational differences in knowledge, attitudes, and usage patterns regarding artificial intelligence (AI). Younger generations, particularly Generation Z, exhibit higher familiarity with AI technologies, more positive perceptions of their potential, and more frequent practical usage. In contrast, older generations, including Generation X, Baby Boomers, and the Veteran Generation, tend to show lower awareness, more cautious or sceptical attitudes, and limited interaction with AI tools.

One noteworthy finding is the relatively small difference between Generations X and Y across several dimensions of AI perception. This suggests that adjacent cohorts, who have been exposed to similar phases of digital transformation, may share comparable technological attitudes, despite being classified as distinct generations in the literature. Another interesting result is that Generation Y reported more frequent daily AI use than Generation Z. A plausible explanation is that many members of Generation Y are firmly

integrated into the workforce and use AI tools in their professional roles. In contrast, a substantial share of Generation Z respondents are still students who may rely on AI more sporadically, for educational rather than occupational purposes.

These patterns add nuance to the existing literature by showing that generational differences are not strictly linear: middle cohorts such as Generation Y can surpass younger ones in practical AI use, while adjacent generations (X and Y) can display highly similar attitudes when they share comparable technological socialisation experiences.

These differences are statistically significant, highlighting the influence of digital socialisation: individuals raised in a technology-rich environment are more adaptable and open to emerging digital tools. Furthermore, the findings suggest that familiarity with AI is closely linked to perceived usefulness and trust in technology, which in turn affects adoption behaviour. The study also indicates that intergenerational differences could impact workplace dynamics, education strategies, and policy development related to AI integration.

Table 8 below summarises the main conclusions from the research, showing how each generation relates to artificial intelligence – in terms of knowledge, frequency of use, attitude, everyday use, and the underlying reasons.

Table 8. The main results of the research

Aspect	Generation X	Generation Y
AI knowledge	high, but slightly lower	higher
Frequency of use	medium	high, frequent daily use
General attitude	cautious, low trust, regulation-focused	optimistic, pro-development
Everyday use	selective, task-dependent	regular, functional
Key concepts	danger, control, regulation	helpful, future, help
Main reasons	Later digital adaptation	digital socialisation + technological integration at the workplace
Aspect	Generation Y	Generation Z
AI knowledge	high	Highest
Frequency of use	very high, multiple uses per day	very high, multiple uses per week
General attitude	positive, but reflective	most positive, future-oriented

Aspect	Generation X	Generation Y
Everyday use	work-related, functional	linked to learning, media, and the everyday digital environment
Key concepts	usefulness, development, assistance	naturalness, future, technological openness
Main reasons	workplace integration, more mature digital reflection	digital socialisation, greater technological self-confidence

The research suggests that the cautious, control-oriented attitude of Generation X can be an important counterweight to the uncritical adaptation of AI, even if this sometimes results in slower acceptance. The higher frequency of use of Generation Y indicates that AI is becoming more deeply integrated into their daily and work routines, which increases both efficiency and the risk of addiction. The difference between the two generations highlights the need for both the critical, regulation-oriented perspective of Generation X and the innovation-friendly, future-oriented perspective of Generation Y in the social dialogue about AI. It can be stated that AI is no longer a “separate technology” for Generation Z, but a self-evident infrastructure of everyday life. While Generation Y uses AI more as a conscious tool, Generation Z uses it more naturally, but is also at risk of uncritical acceptance. The generational pattern suggests that critical digital and AI literacy, not just technological confidence, will become increasingly important in education and regulation.

Overall, the results underscore the importance of targeted educational initiatives, awareness campaigns, and user-friendly AI systems that account for generational differences. By addressing the specific needs and concerns of different age groups, organisations, and policymakers, organisations can foster a more inclusive, responsible, and effective adoption of AI technologies across society.

References

1. Babu, M.A., Yusuf, K.M., Eni, L.N., Jaman, S.M.S., Sharmin, R.: ChatGPT and generation ‘Z’: A study on the usage rates of ChatGPT. *Social Sciences and Humanities Open* **10**, 101163 (2024)
2. Balon, R.: An explanation of generations and generational changes. *Academic Psychiatry* (2024). <https://doi.org/10.1007/s40596-023-01921-3>
3. Chan, C.K.Y., Lee, K.K.W.: The AI generation gap: Are Gen Z students more interested in adopting generative AI such as ChatGPT in teaching and learning than their Gen X and millennial generation teachers? *Smart Learning Environments* **10**, 60 (2023)

4. Choudhary, R., Shaik, Y.A., Yadav, P., Rashid, A.: Generational differences in technology behaviour: A systematic literature review. *Journal of Infrastructure, Policy and Development* **8**(9), 6755 (2024)
5. Costanza, D.P.: Are generations a useful concept? *Acta Psychologica* (2023). <https://doi.org/10.1016/j.actpsy.2023.104059>
6. Eg, R., Demirkol Tønnesen, Ö., Tennfjord, M.K.: A scoping review of personalized user experiences on social media: The interplay between algorithms and human factors. *Computers in Human Behavior Reports* **9**, 100253 (2023)
7. Elamin, M.O.I.: AI Through the Ages: Unlocking Key Opportunities and Navigating Challenges in the History and Future of Artificial Intelligence. *Peer-reviewed review article* (2024). <https://ijor.co.uk/ijor/article/view/8336/4450>
8. Erdős, F., Thinakaran, R., Furuza, B., Koloszár, L.: The Rise of AI in Tourism—A Systematic Literature Review. *Geojournal of Tourism and Geosites* **60**(2 Suppl.), 1254–1265 (2025)
9. Eslami, M., Rickman, A., Vaccaro, K., Aleyasen, A., Vuong, A., Karahalios, K., Hamilton, K., Sandvig, C.: “I always assumed that I wasn’t really that close to [her]”: Reasoning about invisible algorithms in the news feed. In: *CHI ’15: Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, pp. 153–162. ACM, New York (2015)
10. Fuchs, O., Lorenz, E., Fuchs, L.: Generational differences in attitudes towards work and career: A systematic literature review on the preferences of Generations X, Y and Z. *International Journal of Innovative Research and Advanced Studies* **11**(7), 54–71 (2024)
11. Hargittai, E.: Second-level digital divide: Differences in people’s online skills. *First Monday* **7**(4) (2002)
12. Huang, T.W., Smith, C., McGuire, B., Yang, G.: The history of artificial intelligence. University of Washington (2006). <https://courses.cs.washington.edu/courses/csep590/06au/projects/history-ai.pdf>
13. Joo, J.Y., Liu, M.F., Ho, M.-H.: Nurses’ perceptions of artificial intelligence adoption in healthcare: A qualitative systematic review. *Nurse Education in Practice* **88**, 104542 (2025)
14. Katsantonis, A., Katsantonis, I.G.: University students’ attitudes toward artificial intelligence: Cognitive, emotional, and behavioural dimensions. *Education Sciences* **14**(9), 988 (2024)
15. Kaur, R., Gabrijelčič, D., Klobučar, T.: Artificial intelligence for cybersecurity: Literature review and future research directions. *Information Fusion* **97**, 101804 (2023)
16. Kokina, J. et al.: Challenges and opportunities for artificial intelligence in auditing: Evidence from the field. *High-impact Information Systems Journal* (2025). <https://doi.org/10.1016/j.accinf.2025.100734>

17. McKercher, B.: Age or generation? Understanding behaviour differences. *Tourism Management* (2023). <https://doi.org/10.1016/j.annals.2023.103656>
18. Negash, S., Gundlack, J., Buch, C., Apfelbacher, T., Schildmann, J., Frese, T., Christoph, J., Mikolajczyk, R.: Physicians' attitudes and acceptance towards artificial intelligence in medical care: A qualitative study in Germany. *Frontiers in Digital Health* **7**, 1616827 (2025)
19. Neves, B.B., Amaro, F., Fonseca, J.R.S.: Coming of (old) age in the digital age: ICT usage and non-usage among older adults. *Sociological Research Online* **18**(2), 22–35 (2013)
20. Rudolph, C.W., Rauvola, S., Costanza, D.P., Zacher, H.: Debunking ten myths about generations and generational differences in organizational science and practice. *Industrial and Organizational Psychology* (2020)
21. Seyfi, S., Lee, C., Jo, Y., Kim, M.J.: Generational differences in adopting AI-generated travel advice: What drives trust and reduces resistance? *Tourism Management Perspectives* **57**, 101364 (2025)
22. Sharma, P., Bhattacharya, S., Bhattacharya, S.: HR analytics and AI adoption in IT sector: Reflections from practitioners. *Journal of Work-Applied Management* (ahead-of-print, 2025)
23. Sultana, A., Abdul Latheef, N., Siby, N., Ahmad, Z.: Exploring students' attitudes toward artificial intelligence (AI): Psychometric validation of AI-attitude scale. *SAGE Open* **15**(4) (2025)
24. Twenge, J.M.: Generational differences in life goals, concern for others, and civic orientation. *Journal of Personality and Social Psychology* (2012)
25. Yang, J.-M., Hsu, K.-C.: The dark side of AI adoption: A study of innovation resistance, job dissatisfaction, and workplace complaints in the franchised retail sector. *Journal of Retailing and Consumer Services* **88**, 104562 (2026)
26. Zhou, Y., He, T., Lin, F.: The digital divide is aging: An intergenerational investigation of social media engagement in China. *International Journal of Environmental Research and Public Health* (2022)

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

